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ABSTRACT

Two sets of research findings are available that may provide a sound base for conducting vocational education research leading to systematic program improvement and to the attainment of excellence in education. The first is effective schooling research and the second concerns principles used by successful businesses in the United States. An examination of some of the major effective school research studies conducted in the past four years suggests a number of possibilities for similar research in the area of vocational education. For example, researchers could design effective school studies to identify the differences in educational practices that account for differences in observed outcomes. Also in need of examination are students' attitudes towards vocational and academic curricula. A third broad feature related to studies of effective schools is the emphasis on collecting and applying research findings to help districts and schools improve their effectiveness. Also supplying proposed future directions for research to improve vocational education are principles of excellence that have recently been identified in a multi-year study focusing on 62 of America's best-run companies. Included among these principles are the following: willingness to experiment and take risks, attention to customer needs, autonomy to foster innovation, productivity through people, flexible staffing with flatter hierarchies, and coexistence of central direction and maximum autonomy of work units. (MN)

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Research Summary Report

DESIGNING EXCELLENCE IN SECONDARY VOCATIONAL EDUCATION: APPLICATIONS OF PRINCIPLES FROM EFFECTIVE SCHOOLING AND SUCCESSFUL BUSINESS PRACTICES

by
Thomas R. Owens
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U.S. DEPARTMENT OF EDUCATION
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DECEMBER 1983

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PREFACE

During 1983, the Northwest Regional Exchange sponsored the development of six focused research reports whose topics were identified by the states within the region-- Oregon, Alaska, Hawaii, Washington, Montana, Idaho, and the Pacific area. The titles of these publications include:

- Designing Excellence in Secondary Vocational Education: Applications of Principles from Effective Schooling and Successful Business Practices
- Toward Excellence: Student Teacher Behaviors as Predictors of School Success
- State Level Governance: Agenda for New Business or Old?
- A Call for School Reform
- Global Education: State of the Art
- Equitable Schooling Opportunity in a Multicultural Milieu

We have found this dissemination strategy an effective and efficient means of moving knowledge to the user level. Each report is in response to state defined information needs and is intended to influence the improvement of school practice. In each case, a specific knowledge(s) base, anchored in research and development, is analyzed and synthesized. The process is more telescopic than broadly comprehensive in nature. Elements of careful selectivity and professional judgment come into play as authors examine the information against the backdrops of current state needs, directions, and/or interests. As a result, research-based implications and recommendations for action emerge that are targeted and relevant to the region.

J.T. Pascarelli

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DESIGNING EXCELLENCE IN SECONDARY VOCATIONAL EDUCATION: APPLICATION OF PRINCIPLES FROM EFFECTIVE SCHOOLING AND SUCCESSFUL BUSINESS PRACTICES

EXECUTIVE SUMMARY

Recent reports such as the National Commission on Excellence in Education (Commission Report 1983), the Task Force on Education for Economic Growth (Task Force Report 1983), and the Carnegie Foundation (Boyer 1983), have received headline attention for their strong criticisms of American public secondary education. One conclusion from these reports is that secondary schools have been ignoring excellence. The often-heard remedy is that steps should be taken to strengthen academic standards for high school graduation. Some attention is given in these reports to the needs of noncollege-bound students, but virtually none is given to those students choosing vocational education. If educational excellence is to affect the lives of all young people in America, it cannot be limited only to those wishing to pursue an academic curriculum.

In the haste to define academic excellence, many educators have ignored the question of what vocational excellence means and how to achieve it. The private sector, however, has a view of vocational excellence based on their expectations for new employees coming into the job market. Employers are looking for young people with basic academic skills, a positive work ethic, flexibility, and in many cases, new basic occupational skills needed on the job.

Unfortunately, there is no widely accepted set of criteria for judging excellent vocational education programs or their outcomes.

In addition to a lack of agreement on vocational education outcomes there is no consensus as to what factors lead to successful programs. This lack of agreement has contributed to research in vocational education having limited impact on improving practice.

Two sets of research findings are available that may provide a sound base for conducting vocational education research leading to systematic program improvement. The first is effective schooling research; the second concerns principles used by successful businesses in the United States.

Effective Schooling Research

Effective schools research was initiated in the 1970s in partial response to the earlier studies of Coleman and others which concluded that educational programs do not make a difference in learning outcomes. While the majority of these effective schools studies center on basic academic skill achievement in elementary school children, studies in the past four years have included secondary education as it relates to a broader set of learner outcomes. Perhaps even more important than the results of these studies is the way in which they have been synthesized and used systematically as a foundation for changing practices in many of America's schools.

This paper discusses some ways in which effective schools research can be applied to vocational education. Selected applications of effective schooling research are viewed from both macro and micro perspectives. At the macro level, we first examine the broad research designs used to identify effective schools to determine what differences in educational practices account for differences in

observed outcomes. Applications of similar designs to vocational education research could result in a more systematic study of program features contributing to excellence in vocational outcomes. A second macro perspective examines the social organization of the school as an overarching concept found by Rutter and his associates to explain many of the separate factors associated with effective high schools.

As applied to vocational education this could suggest looking at students' attitudes toward being a vocational curriculum or academic curriculum student. Several secondary vocational education studies have already found a much more positive attitude of students toward their vocational courses than to their nonvocational courses. Participation in vocational clubs may also be a factor in helping students feel a close bonding to their vocational programs.

A third broad feature related to the effective schools studies is the emphasis on collecting and applying the research findings to help districts and schools improve their effectiveness. The national network of educational laboratories and research and development centers has joined forces to disseminate the research findings to schools and to provide technical assistance, whenever possible, in applying the findings to solving school-based problems. In this sense, the effective schooling movement has grown beyond syntheses of research studies to a concentrated attempt to reform educational practice. Vocational education could benefit from participating in these dissemination and school improvement efforts.

Effective schooling research has received good press, primarily due to the findings it has delivered on concrete issues facing

education today. At the micro level, this paper applies six aspects of effective schooling to vocational education: (1) time on task, (2) expectations of performance, (3) student motivation, (4) cooperative learning, (5) effective learning climate and (6) use of evaluation. These six aspects were selected because they were found to be supported across multiple research studies and have strong potential for application to vocational education. Some of these factors, such as time on task, have already been applied to vocational education while others await such application.

For example, the National Center for Research in Vocational Education has an ongoing study to apply time on task findings to agricultural education, marketing and distributive education, and to trade and industrial education. Their instruments were designed to show the amount of time students spend on task on content (basic skills, technical skills, employability skills) as compared with time spent on noncontent (set up, clean up, etc.) and off task (time spent on breaks and socializing). They found that the average proportion of time on task in vocational programs is very similar to the time on task found in studies conducted in academic areas. Longer classes and classes with fewer students had the highest proportion of time on task. Obviously, such studies if replicated locally, would have direct implications for both policy and practice.

Research on "cooperative learning" has not been found to influence the direction of vocational researchers although it holds great potential. Vocational education programs provide excellent settings for cooperative learning and team competition. The latter

competitions can occur especially through vocational clubs that may involve group projects. Research on cooperative learning in effective schools suggests that vocational teachers should: 1) discuss with students the concept of team learning, 2) form teams that reflect a range of performance, sex and ethnic mix of the class, 3) select rewards that are attractive to the student peer culture, and 4) observe both individual and group accountability.

Vocational teachers typically use a variety of group activities including:

- Livestock judging teams at county and state fairs
- Model or simulated office operations
- Auto diagnosis and repair contests
- School landscaping project
- Construction of an actual home
- Planning and implementing a fashion show

Additionally. school-endorsed programs such as Junior Achievement, Explorer Scouting and 4-H accomplish their activities through cooperative learning activities. Principles recently derived from cooperative learning research could substantially strenghten and help justify such out-of-class vocational activities.

Successful Business Principles

Also supporting proposed future directions for research to improve vocational education are principles of excellence identified by Thomas J. Peters and Robert N. Waterman, Jr. Their book titled In Search of Excellence: Lessons from America's Best-Run Companies (1982), is the result of a several year study focusing on 62 of America's best-run

companies. These researchers uncovered eight principles that seem most important in describing the practices of successful companies. Peters and Waterman have labeled the eight principles: 1) A Bias for Action (a willingness to experiment and take risks); 2) Close to the Customer (attention to customer needs); 3) Autonomy and Entrepreneurship (autonomy to foster innovation; 4) Productivity Through People (people treated as adults and partners); 5) Hands-On, Value-Driven (clearly communicated values); 6) Stick to the Knitting (concentrate on the things you do best); 7) Simple Form, Lean Staff (flexible staffing with flatter hierarchies); and 8) Simultaneous Loose-Tight Properties (co-existence of central direction and maximum autonomy of work units). We describe each of these, giving examples from business and indicate ways they currently apply to vocational education and ways they might be applied.

Recommendations

Recommendations of this paper are presented for improvement in vocational education policy, program practice, and vocational education research. Policy implications center on state and local leaders defining the key purposes for secondary vocational education and their relationship to the overall goals of the high school. Examples are given as to how academic and vocational objectives can reinforce each other. Recommendations for improving practice are reflected in criteria for self-evaluation of vocational education programs. These criteria are taken from principles derived from effective schooling and successful businesss practices. Recommendations also focus on a set of key issues that could be used to guide future research on vocational education. For

example, future research might apply effective schooling findings to a better understanding of the leadership role of vocational administrators and to principles of effective teaching in vocational courses. Such studies would serve to build a sound base for improving programs and thus contribute to excellence in vocational education.

I. INTRODUCTION

Audiences

As a result of recent national reports critical of secondary education in the United States, increased attention is being given at the local, state, and national level for the need to develop academic excellence in education. In the haste to define academic excellence, many policy makers and educators have ignored the question of what vocational excellence means and how to achieve it. This paper takes an exploratory look at vocational excellence and suggests how principles derived from effective schooling research and from a study of successful business could be used to enhance our understanding and improvement of vocational education. This paper is intended for vocational education policy makers, vocational directors, and those involved in establishing and carrying out an agenda for future research in vocational education. The executive summary of this paper could be used with legislators, advisory committees, vocational instructors, and employers.

Description of Contents

Section II of this paper discusses new demands for educational excellence in light of recent national reports criticizing secondary education. Implications of the push for academic excellence for vocational education are described together with efforts to identify expectations for vocational education.

The main focus of this paper is illustrated in Chart I which displays selected principles from effective schooling research and from a study of successful business practices. Section III of this paper discusses the origins of effective schooling research and reviews selected findings from a macro and micro perspective. Limitations of effective schooling research are listed. Ways in which effective schooling research has been linked to school improvement are described.

Also described in Section IV are ways in which findings from effective schooling research can be applied to secondary vocational education while Section V focuses on the application of findings from studies of successful businesses. In Section VI we discuss the conclusions of this paper and make recommendations for using the findings to improve vocational education policy, practice, and future research. This is followed by a bibliography.

TABLE 1

APPLICATIONS OF SELECTED PRINCIPLES FROM EFFECTIVE SCHOOLING RESEARCH AND SUCCESSFUL BUSINESS PRACTICES TO SECONDARY VOCATIONAL EDUCATION

Effective Schooling Practices	Successful Business Practices
• Time on Task	• A ias for Action
• Expectations of Performance	• Close to the Customer
• Student Motivation	• Autonomy and Entrepreneurship
• Cooperative Learning	• Productivity Through People
• Effective Learning Climate	• Hands On, Value Driven
• Use of Evaluation	• Stick to the Knitting
	• Simple Form, Lean Staff
	• Simultaneous Loose-Tight Properties

Applications to Secondary Vocational Education

- Policy
- Practice
- Research

II. NEW DEMANDS FOR EDUCATIONAL EXCELLENCE

Recent National Reports Criticize Secondary Education

> When I say excellence, I am not referring to the top academic performers in our schools. By excellence I mean that every youngster should have the opportunity to succeed to her or his highest potential. That means excellence in our programs for the handicapped as well as the talented and gifted, in vocational education and the arts as well as in math and science.

The preceding quote by Oregon State Superintendent, Verne A. Duncan, in his annual State of the Schools address (1983), makes a specific and deliberate plea for enhancing school improvement efforts so all students might achieve excellence. In a speech delivered to the Vocational Industrial Clubs of America (VICA) National Leadership Conference (1983), President Reagan emphasizes:

> And each generation must realize that to achieve America's potential we need all our people with all their talents working together. That's why our drive for excellence in education must reach every student in every school in every subject. We should see that all our young people get a good grounding in English and literature, history, math, science and the other basics. But we must also recognize that our vocational classrooms are just as important as any other. And we should insist that the vocational courses we teach prepare this generation with the skills they need for real jobs.

However, in reviewing some recent national reports on the state of education today, we do not find that same commitment and appeal for equality for those students outside the college-bound stream.

Several recent reports criticizing American public secondary education have received national attention. The National Commission on Excellence in Education was charged with examining the quality of education in the United States and subsequently, to make a report to the Nation and to the Secretary of Education. The ensuing report, A Nation at Risk: The Imperative for Educational Reform (Commission Report 1983), addressed the following:

- Assessing the quality of teaching and learning in our nation's public and private schools, colleges and universities
- Comparing American schools and colleges with those of other advanced nations
- Studying the relationship between college admissions requirements and student achievement in high school
- Identifying educational programs which result in notable student success in college
- Assessing the degree to which major social and educational changes in the last quarter century have affected student achievement
- Defining problems which must be faced and overcome if we are to successfully pursue the course of excellence in education

Notably absent in this list is equal attention given to the needs of noncollege bound students and students choosing vocational education. Though the report makes mention of those students not typically involved in college preparatory programs, minimal consideration is given to vocational education as a viable option for these students as evidenced in the following paragraph (Commission Report 1983):

> We must emphasize that the variety of student aspirations, abilities, and preparation requires that appropriate content be available to satisfy diverse needs. Attention must be directed both to the nature of the content available and to the needs of particular learners. The most gifted students, for example, may need a curriculum enriched and accelerated beyond even the needs of other students of high ability. Similarly, educationally disadvantaged students may require special curriculum materials, smaller classes, or individual tutoring to help them master the material presented. Nevertheless, there remains a common expectation: we must demand the best effort and performance from all students, whether they are gifted or less able, affluent or disadvantaged, whether destined for college, the farm, or industry.

A second report to achieve widespread press was compiled by the Task Force on Education for Economic Growth: Action for Excellence. A Comprehensive Plan to Improve Our Nation's Schools. Eight Action Recommendations are proposed by the committee (Task Force Report 1983):

1. Develop--and put into effect as promptly as possible--state plans for improving education in the public schools from kindergarten through grade 12.
2. Create broader and more effective partnerships for improving education in the states and communities of the nation.
3. Marshal the resources which are essential for improving the public schools.
4. Express a new and higher regard for teachers.
5. Make the academic experience more intense and more productive.
6. Provide quality assurance in education.
7. Improve leadership and management in the schools.
8. Serve better those students who are now unserved or underserved.

On the surface, Action Recommendation 8 would seem to address the needs of students not pursuing college preparatory studies. On closer inspection, however, the recommendation more directly speaks to the needs of equality in education for young women, minorities, and the handicapped.

Yet a third report to gain extensive public attention is the Carnegie report offering a plan for high school reform. High School: A Report on Secondary Education in America, a study by the Carnegie Foundation for the Advancement of Teaching, presents an agenda for action to improve our nation's secondary schools. The report identifies twelve themes that provide a framework for reform (Boyer 1983):

1. Clarifying Goals
2. The Centrality of Language
3. The Curriculum as a Core
4. Transition to Work and Learning
5. Service: The New Carnegie Unit
6. Teachers: Renewing the Profession
7. Instruction: A Time for Learning
8. Technology: Extending the Teacher's Reach
9. Flexibility: Patterns to Fit Purpose
10. The Principal as Leader
11. Connections
12. Excellence: The Public Commitment

The fourth theme, Transition to Work and Learning, gives credence to the importance of preparing students for the changing nature of the world of work (Boyer 1983):

> The high school should help all students move with confidence from school to work and further education. Today, we track students into programs for those who "think" and those who "work," when in fact, life for all of us is a blend of both. Looking to the year 2000 we conclude that, for most

> students, 12 years of schooling will be insufficient. Today's graduates will change jobs several times. New skills will be required, new citizenship obligations will be confronted. Of necessity, education will be lifelong.

As with the two preceding reports, this one gives no specific and direct solutions for preparing noncollege bound students for future work.

In reviewing national reports on the state of education today, one can easily discern the lack of equitable consideration for the needs of students wishing to pursue vocational programs. The push for academic excellence appears to leave out vocational education. Gordon Swanson (1983) in commenting on these national reports expressed concern that they confused means (e.g., more course requirements) with ends (multi-differentiated outcomes). He felt three essential questions need to be addressed by policy makers in discussing excellence in education--what should be taught, to whom, and for what purpose? The national reports on excellence focused on the first question but ignored the most important second and third questions.

In contrast to these reports on secondary education, the National Research Council Committee on Vocational Education and Economic Development in Depressed Areas has prepared a comprehensive report on the role vocational education should play in secondary education. In their book Education for Tomorrow's Jobs (Sherman 1983) the committee states:

> Vocational education is a vital part of the public education system in this country, one that has long been slighted in favor of academic education. Basic academic as well as occupational skills are

> of fundamental importance in preparing young people for productive lives in our society. The public elementary and secondary schools in this country should offer students who will not go to college a thorough grounding not only in language skills, reasoning, and mathematics, but also in the mechanical and technical skills and work habits that will prepare them for working life (pg.1).

Academic Excellence and Vocational Education

Some argue that the push to achieve academic excellence by increasing high school graduation requirements will benefit all students, that is, students planning to enter the work force immediately after graduation and those planning to enter and complete college. Since many high school students, including those who enter jobs after graduation, may eventually enter college, a broad background that would prepare them for that possibility is essential.

Others would argue that by raising the number of academic courses needed for high school graduation, students will not have time to gain the concrete training they need for job entry upon completing high school. This group feels that simply mandating more units of science and math for all students does not ensure that these courses will be of excellent quality. Those supporting the role of vocational education in the comprehensive high school share the belief that science, math, and communication skills are important. They argue, however, that for many students who are more action-oriented in their approach to learning, integrating math, science, and communication skills into applied vocational programs is a more appropriate way to help students master these skills.

Gene Bottoms, executive director of the American Vocational Association, has recently observed:

> The agenda for excellence that is rolling across America is far too narrow. It ignores the fact that individuals learn differently, come from different family backgrounds, and have different aspirations. It assumes that there is a single best way. It seems to be saying that doing more of what we are already doing badly will produce excellence (1983, pg. 9).

Regardless of the position one takes on the number of units of academic or vocational classes that students should be required to take, there is general agreement that the quality of all these courses and of education in general needs improvement. Thus, the focus of this paper is to address how factors that have been found successful in improving academic education and business can be applied to improving secondary vocational education. Since one important outcome of vocational education is to prepare students for job entry, we cannot understand what excellence in vocational education means without considering first what employers expect of newly employed high school graduates.

Employer Expectations

The Center for Public Resources surveyed educators and employers in 1982 for their views on basic skills deficiencies among high school graduates entering the work force. The results revealed that "there is a considerable gap between the perceptions of school officials and the perceptions of employers when it comes to the adequacy of

education for employment" (Task Force Report 1983). Employers were more critical of basic skills deficiencies.

Future workers will face complex problems. To perform successfully in the marketplace, workers will need to be resilient, versatile, independent, and able to interact cooperatively and ethically with others. A recent study conducted by the Northwest Regional Educational Laboratory (NWREL) found that employers in three major Northwest industries--electronics, wood products, and the health field--mentioned the following skills as important: communication skills, interpersonal skills, and the foundation of a solid but broad fundamental education (Crohn 1983). Adaptability is becoming increasingly important as a trait employers desire. "Things have changed so much and so rapidly," says one personnel manager, "that one thing we have to be sensitive about is the willingness of a person to accept change in the environment" (Crohn 1983). Similarly, a person who comes to new employment with the ability to perform more than one task is considered to be more valuable than the worker with a limited skill range. Being "flexible" was a term heard in the NWREL interviews with employers as a desirable attribute because of the potentially changeable nature of the work environment. This generally meant the ability to handle more than one task at a time.

Another study (Richards 1981) synthesized 11 earlier studies of employer expectations for young employees. Expectations centered on: basic academic skills, communication skills, knowledge of the world of work, interaction with fellow workers and superiors, positive attitudes toward work, dependability, craftsmanship and productivity.

In looking at employer attitudes toward and perceptions of the deficiencies in the job performance of young people, one study of over 800 employers uncovered three basic problem areas: 1) poor performance in basic skills, particularly oral and written communications; 2) poor work attitudes; and 3) a general lack of understanding about the world of business (Owens 1983).

Psychological and social maturity was found to be one of five factors that make youth more employable in a study done at the University of Minnesota (Hadin 1983). Key dimensions of maturity include a sense of social and personal responsibility, self-control, self-direction, and a sense of obligation to complete tasks. These findings are supported by a study at Far West Laboratory: "What employers want from the schools is motivated people with the understanding and maturity to fit into an adult organization, and the basic and functional skills that enable them to grow. Without these qualities, technical job skills are of limited value to the young worker, the employer, and to the nation's long-range needs for a more productive work force" (Peterson 1982).

Identifying Vocational Excellence

Identifying excellence in vocational education demands an understanding of what vocational education is intended to accomplish.

Defining the purposes and expected outcomes of vocational education has been one of the biggest obstacles in planning and evaluating secondary vocational education. Although numerous studies of secondary vocational education have occurred, no consensus exists

as to the key aspects that should be measured (Darcy 1980). Various approaches have been used to determine effectiveness of vocational education programs. Since many schools receive at least a small amount of federal funds for vocational education, the criteria being considered by Congress merit attention. The proposed Vocational-Technical Act of 1983 (HR.4164) considers vocational education effectiveness to be the extent to which program completers find employment in occupations for which skills were acquired, demonstrate knowledge and skills common to vocational programs, and are considered well-trained and prepared by employers. Legislators also call for vocational programs that are relevant to labor market needs. Vocational excellence can also be considered. Today, however, many observers feel that placement and early employment experience are not adequate criteria for judging program effectiveness. These narrow criteria ignore the overshadowing effects of the local economy on job placement, the tendency of youth to explore various jobs in their initial years in the labor market, and the fact that many youth go on to postsecondary education immediately after completing high school.

More than 100 vocational education outcomes have been identified in a Thesaurus of Outcome Questions (Farley 1979). These have been organized in various ways. For example, Harry Silberman has distinguished between intrinsic and extrinsic purposes (1983): "The intrinsic purposes are the immediate consumption values, regarded as ends in themselves: e.g., stimulation, recreation, understanding. The extrinsic purposes are the utilitarian values of the program, regarded as means to attain future benefits: e.g., employment, income, labor

supply, economic productivity" (p.13). Silberman goes on to argue that vocational education has more direct influence over the intrinsic than the extrinsic outcomes. He identifies three intrinsic outcomes of concern to teachers of secondary vocational education: technical skills and knowledge, communication skills and literacy, and personal skills and attitudes.

In designing a statewide study of secondary vocational education effectiveness for Oregon, NWREL adapted a framework used at the National Center for Research in Vocational Education (NCRVE). Outcomes are organized under four headings--occupational, educational, ancillary, and societal (Owens 1982).

Examples under these categories are shown in Table 2. After reviewing much of the prior research on vocational education effectiveness, the NWREL researchers extracted a list of outcomes and of quality program indicators. A state project steering committee composed of vocational educators, administrators, and employers reviewed the lists of 20 outcomes and 20 indicators and provided a rating of importance for each outcome and quality program indicator. A similar process was used to obtain ratings from the vocational education research directors in Arizona, Florida, Illinois, Ohio, Oregon, and South Carolina. The rank orderings of these two groups on the outcomes were used as the basis for developing student, parent, employer, and vocational educator evaluation instruments.

The outcomes ranked most important were possession of occupational skills needed for job entry level, ability to apply basic literacy skills to work tasks, ability to meet the local labor market demand,

interpersonal skills, pride in producing quality work, possession of good work habits, and development of transferable occupational skills. Quality program indicators receiving top priority were availability of instructional staff with adequate training and experience in their vocational area; improved linkage with business, industry, and labor; placement of completers in employment related to their vocational training; availability of quality cooperative work-experience opportunities; and realistic instructional experiences.

TABLE 2

EXAMPLES OF SECONDARY VOCATIONAL EDUCATION OUTCOMES

Category	Illustration
Occupational	• Possession of occupational skills needed for job entry level
	• Possession of transferable occupation skills
Educational	• Adequate understanding of fundamental principles as a basis for advanced training
	• Articulation of high school and postsecondary training programs
Ancillary	• Possession of leadership skills
	• Ability to cope with changing technology
Societal	• Providing a supply of people trained in emerging occupational areas
	• Effective collaboration between the business community and the schools

The Division of Occupational Education Programs in the New York State Education Department has been involved in a massive Occupational and Practical Arts Futuring Project to examine the future direction of vocational education in their state. Part of the process involved the use of a delphi technique to obtain consensus from many education committees and business representatives within New York regarding skills and knowledge to be developed through occupational and practical arts education. Their priorities, in rank order, are shown in Table 3. They also rated services of Occupational and Practical Arts Education to business and society. These priorities, in rank order, are shown in Table 4.

Table 3

RANK ORDER OF PROPOSED VOCATIONAL EDUCATION SKILLS AND KNOWLEDGE OUTCOMES RATED BY EDUCATORS AND BUSINESS PEOPLE IN NEW YORK STATE

1. Basic technical skills which are common to a cluster of jobs
2. Employability skills, such as promptness, dependability, and self-reliance
3. Abilities in problem solving, communications, decision making, interpersonal relationships, and resource management
4. Basic skills in use of common hand tools and machines as well as understanding of various materials and work processes
5. Technological literacy (i.e., conceptual understanding of computers, communication systems, etc.)
6. Ability to cope with life situations and to realize self-awareness and self-worth
7. Technical reading, writing, and mathematics skills which relate to a specific occupational or practical arts instructional program area
8. Career awareness and the ability to make career and educational choices
9. Basic reading, writing, and mathematics skills
10. An awareness of, and positive attitude toward safety procedures
11. Knowledge of basic ecomonic concepts
12. An ability to take advantage of inevitable change
13. Technical skills which are specific to one job
14. Awareness of the role and responsibility of individuals working alone and in groups
15. Ability to manage a home and personal business affairs
16. The capacity for self-fulfilling use of leisure time

TABLE 4

RANK ORDER OF PROPOSED VOCATIONAL EDUCATION SERVICES RATED BY EDUCATORS AND BUSINESS PEOPLE IN NEW YORK STATE

1. Be responsive to the needs of emerging occupations
2. Produce a supply of qualified graduates adequate to meet the employment needs of business and industry in the State
3. Provide program offerings which are based upon employment opportunities in the region or State, and not simply on student interest
4. Provide services which assist the student in making the transition from school to employment and/or to more advanced education
5. Provide accessibility to programs for all interested individuals
6. Provide training or retraining for unemployed/underemployed
7. Promote the right of every individual to a chosen career without regard to traditional barriers
8. Coordinate with general and postsecondary education and with military and industrial training programs
9. Meet short-term training needs of business and industry
10. Be responsive to changing management structure (i.e., shared decision making and quality circles)
11. Be designed to improve the ability of individuals to be effective entrepreneurs
12. Develop an understanding of an individual's responsibility in protecting the environment for social and personal benefit
13. Promote and support the values of the American economic system
14. Contribute to the maintenance of a trained labor force for national defense needs
15. Develop an understanding of all economic systems

Recently, the federal Education Department established the Secretary's Award for Outstanding Vocational Education Programs. Criteria used in selecting these exemplary programs consisted of the following: 1) the presence of explicitly stated objectives consistent with the program purposes, 2) evidence of progress toward achieving those objectives, 3) the quality of instructional materials used by instructors and students, 4) appropriateness of equipment and facilities, 5) hands-on experiences for students, 6) planning and cooperation with local businesses, labor leaders, and other organizations, 7) use of evaluation and feedback, 8) high placement rate and employer satisfaction with the graduates, 9) cost-effectiveness, and 10) program recognition and/or publicity.

In summary, there is no national agreement regarding key outcomes of secondary vocational education. However, in our opinion, a growing consensus seems to be emerging that at the secondary level: 1) vocational education should be integrated with academic education, 2) technical skills should focus more on those common to a cluster of jobs than on a single occupation; 3) employability skills such as dependability, the ability to get along with others, and an understanding of the world of work are important; and 4) basic communication, computation, and problem solving skills should be reinforced as they are applied to occupational preparation. In the next section of this paper, we turn to effective schooling research as one base for improving vocational education.

III. EFFECTIVE SCHOOLING RESEARCH OFFERS DIRECTION FOR VOCATIONAL EDUCATION

Origins of Effective Schooling Research

The most influential school effectiveness study sponsored by the United States government was reported by Coleman and his colleagues in 1966. Coleman's nationwide survey of schools resulted in Equality of Educational Opportunity. A major conclusion of this report stated, "school brings little to bear in a child's achievement that is independent of his background and general social context" (Coleman 1966).

Coleman's conclusion came as a surprise; up until that point, American society held the common belief that schools are fundamental in reducing inequality. Another Coleman finding startled educators--school characteristics and resources seemed to make little difference in student measured levels of achievement. According to Coleman, home background prior to entering school was the most critical factor influencing student achievement.

The Coleman Report had major impacts on later school effectiveness studies. It not only accelerated the growing debate on the effectiveness of schools, it also altered perceptions as to what constitutes equal opportunity for students. Prior to the report, equal opportunity generally meant equal access to such resources as libraries, books, lab facilities, and so on. Coleman showed these to have relatively little effect on student achievement; the result was a dramatic shift in beliefs regarding equal education opportunity.

Educators began to put the emphasis on tested achievement as a means of determining equal opportunity for students.

Reactions to the Coleman Report included some well-grounded criticisms ranging from procedural and mechanical errors in the ways the data were handled to defects in the analysis. However, it was the Coleman Report that began the serious inquiry into what constitutes effective schools.

Review of Effective Schooling Approaches and Findings--Macro and Micro Views

A Macro View

In reviewing individual studies and syntheses of effective schooling research, we became aware of both macro and micro approaches. Three macro and six micro views are examined in this paper. At the macro level, there is a guiding assumption underlying the research. It is assumed that there are significant differences in levels of educational outcomes across schools that can be accounted for by differences in educational treatment and not just by student socioeconomic status. Thus, effective schooling researchers have sought to identify outlier schools (extreme examples on either end of a continuum) whose students score especially high or low on a particular outcome measure such as a standardized test of basic skills. High and low performing schools are then studied to determine what differences in educational practices may account for the differences in measured outcomes.

The application of an outlier design approach to vocational education research could result in a more systematic study of program features that contribute to vocational excellence. In states or districts where competency based measures are used for specific occupational areas or for broader vocational outcomes, the schools or programs scoring especially high or low, after adjusting for pretest scores and the socioeconomic level of the neighboring community, could be selected for a more intensive look. The closer look would focus on specific characteristics of the vocational programs at each end. For example, a state having 50 high school industrial mechanics programs might study what variations in course content and instructional modes result in greater gains of students on competency based performance measures, attitudes toward mechanics, and future placement of students in related positions or in advanced training in this field.

A second feature of many school effectiveness studies is that schools which are found to be high or low on one outcome measure tend to be so on other measures. Thus, Michael Rutter and his colleagues came to the conclusion in Fifteen Thousand Hours that "the combined effect was much more powerful than that of any individual factor considered on its own. For this and other reasons, we have suggested that some kind of overall school 'ethos' might be involved" (Rutter 1982). School 'ethos' is described as the social organization of a school with its own rules, values, and standards of behavior.

As applied to vocational education, this could suggest looking at students' attitudes toward being a vocational curriculum or academic

curriculum student. Several secondary vocational education studies have already found a much more positive attitude of students toward their vocational program than to their nonvocational program. Participation in vocational clubs may also be a factor in helping students feel a close bonding to their vocational programs.

A third broad feature related to the effective schools studies is the emphasis on collecting and applying the research findings to help districts and schools improve their effectiveness. The national network of educational laboratories and research and development centers has joined forces to disseminate the research findings to schools and to provide technical assistance, whenever possible, in applying the findings to solving school-based problems. In this sense, the effective schooling movement has grown beyond syntheses of research studies to a concentrated attempt to reform educational practice. Vocational education could benefit from participating in these dissemination and school improvement efforts.

A Micro View

One reason that effective schooling research has received good press is that it has delivered findings on some very concrete issues facing education today. At the micro level, effective schooling research syntheses have pulled together separate studies to focus on specific issues such as the role of the school principal, staff expectations of students, and teacher behaviors leading to effective classroom learning. In terms of teaching behaviors in instructional programs, one researcher has synthesized much of the recent research

around six functions--review of previous learning, demonstration of new material, guided practice and checking for understanding, feedback and corrections, independent practice, and periodic review (Rosenshire 1982). In this paper we discuss six micro aspects of effective schooling: 1) time on task, 2) expectations of performance, 3) student motivation, 4) cooperative learning, 5) effective learning climate, and 6) use of evaluation. These six aspects were selected because they were found to be supported across multiple research studies, reflect a full spectrum of findings by researchers from diverse backgrounds, and have strong potential for application to vocational education. It is hoped that other researchers will show application of other effective schooling research findings to vocational education. For example, future attention should be given to the leadership role of the principal and research findings related to teacher effects.

Limitations of Effective Schooling Research

As in any research synthesis, the conclusions reached about effective schooling at the secondary level are dependent upon the quality and characteristics of the original research studies (Brookover 1981, Purkey and Smith 1982). Unfortunately, many of these studies contain serious limitations. Following are some of the most common limitations:

- The majority of the studies completed were focused on elementary schools. The application of the same findings to America's high schools is questionable.

- Standardized tests of basic skills are often used as the sole criterion for effectiveness. However, many of the outcomes considered important for schools go beyond basic skills as measured by a particular standardized test.

- One-shot studies have generally been conducted rather than longitudinal studies. Thus, it is not clear whether there would be a recurrence of findings from year to year.

- Findings across separate studies are often inconsistent. For example, the role that teacher expectations of student performance play in increasing learning is not clear.

- In some studies, the effective schools tend to be found more frequently in communities with higher socioeconomic status. Thus, it is not known if the differences are attributable more to differences in student characteristics or to differences in educational treatment.

- Variables often found associated with effective schools may not be the same ones found to change an average or poor performance school into an excellent school. Research on how to improve schools is a separate body of knowledge. Therefore, these factors may not be that helpful in school improvement.

Linking School Improvement with Effective Schools Research

Research has clearly shown the relationship of certain schooling practices to student achievement. It becomes obvious, rather quickly, when reviewing school effectiveness literature that conclusions regarding specific factors that lead to effective schools are tentative and should be viewed with caution. Variations in findings of school effectiveness studies are rampant; studies of expenditures, facilities and teacher qualifications, for example, have not been consistent in explaining the differences in student achievement as measured by standardized tests. Yet other factors have been shown to be more effective, as evidenced by the preponderance of data generated by the Goal Based Education Program at the NWREL and by other

researchers. The work of these groups indicates that research and development processes and results can be used for local school improvement in a variety of contexts. Some practices have been proven to be more helpful than others because they assist educators in providing better instruction; hence, students learn more. The Goal Based Education Program has found that the following factors, when interrelated, are conducive to learning: 1) a clearly defined curriculum, 2) focused classroom instruction and management, 3) ongoing assessment and evaluation of students and programs, and 4) strong instructional leadership (Effective Schooling Report 1983).

One approach to school improvement looks at the notion of school culture, that is, how at schools link content with process (Rutter 1979, Brookover 1979). Culture refers to the organizational structure: the roles, norms, values, and instructional techniques; to the information imparted in the curriculum (Purkey and Smith 1982). Process includes the political and social relationships of a school as well as to the flow of information. School effectiveness can be determined by a school's climate, composed of attitudes, behaviors, the organizational structure and so on. Therefore, an effective school would be likely to have clear goals related to student achievement, high expectations for students from parents and teachers, and a structure designed to maximize opportunities for students to learn (Purkey and Smith 1982).

The concept of school culture resolves many of the problems associated with school effectiveness studies (Purkey and Smith):

- It assumes that changing schools requires changing people--their behaviors and attitudes--as well as school organization and norms.

- It assumes that consensus among staff is more powerful than overt control, without ignoring the need for strong leadership.

- It has the advantage of being equally applicable to elementary and secondary schools.

- It is neither grade level nor curriculum specific.

IV. APPLYING FINDINGS FROM EFFECTIVE SCHOOLING STUDIES

Design Applications

The National Center for Research in Vocational Education (NCRVE) conducted a comprehensive review of nearly 1500 studies reported since 1968 of the effects of vocational education on participants (Mertens 1980). Their report is based on a synthesis of 88 statewide, regional, or local studies selected on the basis of relevance and meeting minimal standards of methodological acceptability. The NCRVE study found insufficient evidence of vocational education impact in the areas of basic skills attainment, academic abilities, occupational skill attainment, attendance/dropout, attitudes, and values. Procedurally, the studies reviewed were of three types: 1) comparison of vocational education participants on a selected criterion with that of comparison/control participants, 2) comparison of vocational education participants' performance with the general population, and 3) simple descriptions of vocational education students' performance on selected criteria. No comparison was found between schools within a district or state demonstrating high performance versus those demonstrating low performance. Nor were there any studies reported that attempted to identify the effects on student performance of program factors such as those studied in effective schooling research.

Applying Selected Elements of Effective Schooling

Based on our extensive review of effective schooling literature, six factors which have been shown to positively relate to increased learning were selected for consideration by this study: time on task, expectations of performance, student motivation, cooperative learning, effective learning climate, and use of evaluation.

Each of these is supported by empirical data showing positive correlation with learning gains. Additionaly, it was felt that these six are those with greatest potential for application to vocational education settings. The general findings of each critical factor are presented followed by suggested applications to vocational education.

Critical Factor: Time on Task

Researchers have been studying time as an important factor in learning for decades. A direct relationship has been established between achievement and active learning time for both individuals and for groups of students. General findings include:

- There is a clear relationship between active learning time and gains in achievement; the greater the actual time on task, the greater the level of achievement (Bloom 1980).
- The difference in mastery and nonmastery for a student needing corrective instruction is about an hour of extra instruction every two weeks or six minutes of extra time per school day (Bloom 1980).
- Improving achievement by increasing active learning time requires the cooperative efforts of a principal and staff (Brookover et al. 1982).
- Academic Engaged Time (AET) involves: 1) time planned for instruction, 2) time actually spent on instruction, and 3) time the student is actively engaged in learning the task (Brookover et al. 1982).

- Maximum classroom time should be allocated for instruction (Brookover et al. 1982).

- The level of school attendance explains a significant proportion of the variance in school achievement; absent students receive less instruction (Wiley and Harneshfeger 1974).

- Academic instructional time differs among various groups within a school; college bound groups receive more hours of academic work than do vocational educational groups or other student groups (Rosenbaum 1976).

- Teacher reports of time on task are not adequate measures of time usage; only observations by an objective observer give valid measures (Brookover et al. 1982).

- The Beginning Teacher Evaluation Study (Fisher et al. 1978) suggests that seatwork is one period when students are frequently not on task; absence of direct teacher-student contact during independent work time increases the chance of students not being on task.

- Transitions and discipline are major detractors from time on task (Brookover et al. 1982).

Applications of "Time on Task" to Vocational Education Programs

Only one research study was found that applied effective schooling factors to vocational education. Halasz and Behn at NCRVE looked at time on task as an effective schooling factor within the context of vocational education (1983). Previous studies have shown time on task to be one of the most critical factors that affects how much students learn and achieve in school. Empirical data show: 1) time on task positively relates to student achievement, 2) students in academic classes learn more when time for learning is increased and when students have a high rate of success with learning activities, and 3) students achieve more when teachers lecture, demonstrate, and lead discussions. Yet prior to the Halasz/Behn study, time on task had not

been applied to the vocational setting; virtually no baseline data exist to show how time is spent in vocational education classes.

The purpose of the Halasz/Behn study was to show how time was spent in ten vocational classes by 186 students and their teachers. The ten classes studied were located in seven comprehensive high schools and area vocational schools at four types of sites--rural, suburban, urban and inner city--in four states. Three program areas were represented: agricultural education; marketing and distributive education; trade and industrial education. Two project staff spent two weeks in each class observing and recording students' and teachers' activities each minute with observation instruments designed for the study. The instruments were designed to show the amount of time students spent on task upon content (basic skills, technical skills, employability skills) as compared with time spent on noncontent (set up, clean up, etc.) and off task (time spent on breaks, socializing, and so on). Teacher time was recorded either as content time or as managerial, noncontent time.

Implications of the study as derived by Halasz and Behn include:

1. The average proportion of time on task in vocational programs is very similar to the amount of time on task found in studies conducted in academic areas.

2. A wide variation of time on task was found among the ten classes, especially on content. This indicates that many factors contribute to time usage in secondary vocational education.

3. Students' observed time on task (55.9 percent) was consistently less than time allocated by teachers (67 percent).

4. Longer classes and classes with fewer students had the highest proportion of time on task.

5. Classes with more hands-on activities (trade and industrial and agricultural education) had more time on task than lecture-oriented classes (marketing and distributive education).

6. Results of the study show vocational education classes are diverse; there is no "typical" class that could be representative of all vocational education classes.

Halasz and Behn recommend that since no attempt was made to relate outcomes to time on task, further studies need to investigate this relationship. They feel additional research is needed to examine the relationship of teachers' managerial activities and instructional methods to time on task.

In reviewing this study, three principles seem to emerge when applying effective schooling concepts to vocational education. First, the differences in learning environment must be recognized. Prior time on task measures and instruments were designed largely for single group/total class activity generally led by a teacher. In contrast, the NCRVE team had to develop new categories appropriate to a hands-on setting in which individuals or small groups of students may be working separately. Second, the proportion of time on task from nonvocational classes provides an interesting base for comparison with vocational education as long as one also accounts for the different purposes and activities in these two settings. Third, no "typical" vocational class was found. Thus, it is important to compare findings among areas of vocational training.

Critical Factor: Performance Expectations

Researchers have long noted the link between teachers' expectations and student achievement. What teachers expect students

to learn is likely to result in what students will learn. General findings include:

- Teacher expectations are a strong influence in setting learning climate; the processes by which expectations are formed and transmitted to pupils are largely unconscious, becoming a part of the school learning climate (Brookover 1982).

- Elements of effective schools include: 1) administrators and teachers have high expectations for student achievement, 2) expectations are clearly defined, 3) general expectations are not reduced for any student, 4) students are expected to work toward priority goals, and 5) everyone accepts the notion that school is a place for learning (GBE Program document 1983).

- When students are not successful in academic areas or when academic work is unrelated to current and future goals, they look for recognition outside the school setting; peer social judgment becomes more important as academic success declines (Faunce 1979).

- High expectations result in increased and more effective instruction; low expectations result in decreased and less effective instruction (Brophy and Good 1974, Finn 1972, Persell 1977).

- Teachers' expectations have greater influence on low income and/or minority students than on middle class students (Brookover et al. 1979).

- Parents' expectations and evaluations influence their children (Brookover 1982).

- Almost all students are capable of reaching competence on age/grade level objectives (Bloom 1976).

- Students conform to the level of expectations teachers set (Crano and Mellon 1978, Rist 1970).

- Student expectations are affected by teachers' predispositions in four major areas (Persell 1977):

  1) Teachers' personality traits
  2) Teachers' social experiences and prejudices within the school as well as within the community
  3) Teachers' concepts and beliefs regarding IQ or cultural patterns
  4) Teachers' knowledge and use of such educational structures as grouping arrangements or testing programs

Lowered academic expectations of performance are associated with the following (Brookover 1982):

- Sex--lower expectations are often held for older girls due to sex role discrimination.
- Social Economic Status (SES)--lower expectations are often held for lower SES (including level of parental education, types of jobs held, place of residence, and so on).
- Race--lower expectations are often held for minority status students.
- Test scores, permanent records--a belief in the "fixed ability" of students often precludes the possibility of improvement and higher expectations.
- Negative comments about students--lounge talk and other teachers' or principal's negative evaluations can result in lower expectations.
- Type of school--rural and inner city schools are often associated with lower expectations.
- Appearance--lower expectations are often associated with type, style and expense of clothes, and grooming habits.
- Oral language patterns--negative cues from any nonstandard English speaking student often result in lower expectations.
- Tracking or grouping--labeling effects and a tendency to accentuate differences among students often results in lower expectations.

Applications of "Performance Expectations" to Vocational Education

Performance expectations in vocational education are sometimes introduced through the use of standardized achievement tests in various occupational fields. For example, the National Occupational Competency Testing Institute (NOCTI) has been working with forty-seven states and the District of Columbia to develop both teacher and student occupational competency examinations (NOCTI 1983). NOCTI has

developed Student Occupational Competency Achievement Tests in 19 occupational areas and is currently field testing instruments in 11 additional areas. These written and performance tests reflect the expectations of both vocational teachers and people working in the occupational areas. The results are being used by vocational administrators to assess strengths and weaknesses of current programs and present curricula. Some employers are using the examination for hiring individuals on the basis of demonstrated levels of competence as opposed to letter grades.

Other ways that findings on performance expectations could be applied include:

- Performance expectations in vocational classes need to be reviewed by vocational coordinators, teachers, and vocational advisory committees to determine their appropriateness in relation to students' abilities, available time, and the changing needs of the workplace. Local advisory committees are useful in helping to identify employer expectations for various occupations.
- Teachers' performance expectations for vocational education students need to be clearly communicated to the students and parents. They need to be monitored throughout the course so that students are continuously aware of what is expected and how their individual performance matches up with these expectations.

Critical Factor: Student Motivation

An effective school learning climate includes high expectations for all students to succeed. Researchers have found various reinforcement techniques will help motivate and sustain appropriate student behaviors. For example, Hunter found six teacher behaviors have a powerful effect on student motivation (1979):

1. Concern--students have optimal levels of concern that motivate them to greater effort and higher performance; teachers must sometimes raise, sometimes lower, levels of concern.

2. Feeling tone--whether pleasant, unpleasant or neutral; use of tone depends on the situation, but teachers must return to pleasant tone as soon as the student has performed.

3. Interest--students' interest can be developed by 1) making the learning more meaningful and 2) making the learning more vivid or different from what the student usually experiences or is expecting.

4. Success--motivation increases as success increases; however, some effort is required of the student to feel successful.

5. Knowledge of results--students are highly motivated if they know how they're doing <u>while</u> they're learning.

6. Intrinsic vs. extrinsic motivation--intrinsic motivation is developed when an activity or the learning itself is the reward for effort; extrinsic motivation is developed when the student learns to gain status, approval, grades, or other rewards.

Other general findings regarding student motivation as it relates to learning gains include:

- Positive reinforcement (rewards) are linked to motivation; when the behavior (whether right or wrong) is positively reinforced, the probability of that behavior being repeated is high (Brookover et al. 1982).

- Negative reinforcement used in a nondiscriminating manner is likely to impede student learning (Brookover et al. 1982).

- Praise is relatively easy to apply and is a direct statement of the contingency between the behavior and the reinforcer (Brophy 1981).

- When intrinsic motivation is absent, extrinsic rewards are necessary (Brophy 1981), but intrinsic motivation is a more powerful motivator and more enduring (Crandall, Good and Crandall 1964).

- Teacher praise is not a useful reinforcer in the classroom because it's often misused (Brophy 1981). Most praise is

noncontingent on students' behavior (Harris and Kapche 1978). Inappropriate praise is found among teachers who have low expectations for student learning (Weinstein 1976, Brookover et al. 1978).

- For praise to motivate behavior effectively it must be contingent on performance, specific to the behavior being reinforced, and be sincere and convincing (O'Leary and O'Leary 1977).

Applications of "Student Motivation" to Vocational Education

Several vocational education studies have looked at the reasons why students enter a high school vocational education program. For example, in a statewide study of secondary vocational education, it was found that the most common reasons students gave for entering vocational education programs were an interest in the content area and to learn specific job skills (Owens 1982). Students entering vocational education to learn specific job skills or who had an interest in the area were significantly more likely to report planning to get a job or taking further training in the occupational area than those who entered because their friends were enrolled or because of advice from parents or others.

Vocational clubs such as Future Business Leaders of America (FBLA) and Future Farmers of America (FFA) provide both intrinsic and extrinsic motivation to learn. Public recognition for projects well done is often a strong positive reinforcement for young people. Thus, in looking at excellence in vocational education it becomes important to look not only at what is occurring in the classroom, shop, or laboratory, but also at the informal learning taking place in the community.

Vocational education can also motivate certain students to learn through hands-on experiences who would otherwise be turned off to learning through books and teacher lectures. In a national survey, Donna Mertens and her colleagues (1983) found:

> Students classified as potential dropouts were more likely to finish the tenth grade if they participated in vocational programs. When they reached the legal age of withdrawal from school the following year, however, members of this group tended to leave regardless of the educational program in which they were enrolled. Once past this critical point, vocational education was able to hold the remaining high-risk students in school through graduation at a higher rate than other education programs (AVA Fact Sheet 1983)

In a statewide study of vocational education in Oregon (Owens 1982), students, parents, teachers, and advisory committee members were asked to rate student outcomes resulting from participation in vocational education programs. "Willingness to learn new things" was rated particularly high by each of these groups, indicating an important motivational outcome of vocational education.

Critical Factor: Cooperative Learning

In addition to general findings on student motivation, there has been extensive research on cooperative (team) learning as a motivator. General findings about cooperative learning include:

- Groups have powerful effects on student behavior and motivation; groups reinforce attitudes, actions, and behaviors of the members (Slavin and DeVries 1979).
- Peer relationships strongly influence student feelings about the importance of behaviors, skills and attitudes (McDill and Rigsby 1973).

- Research on cooperative learning techniques prove them to be effective in increasing student performance and positive self-concepts (Slavin and DeVries 1979, 1980; Aronson et al. 1975).

- For group and team competition to work, teachers must effectively use tangible and symbolic rewards that are attractive to the student peer culture (Brookover et al. 1982).

- Team learning research suggests that students prefer to and learn better when they teach and learn from each other (Devin, Sheehan et al. 1976).

- The addition of an effective team incentive system to mastery learning techniques results in greater achievement than either component by itself (Slavin 1983).

- Cooperative learning methods result in positive: 1) race relations, 2) attitudes toward academically handicapped students, 3) self-esteem, and 4) ability to cooperate in other settings (Slavin 1983).

- Among cooperative learning methods where students study the same material together, only those that provide group rewards based on individual learning consistently increase student achievement; group rewards and individual accountability are held to be essential to the instructional effectiveness of cooperative learning methods (Slavin 1983).

- Cooperative learning methods include cooperative incentive structure and cooperative task structure; the critical feature is that two or more students are interdependent for a reward they will share if they are successful as a group (Slavin 1983). Cooperative incentive structure involves rewards for both group and individual learning. Cooperative task structure involves two or more students allowed, encouraged, or required to work together on a task, coordinating their efforts.

- Two factors must be present if cooperative learning methods are to be more instructionally effective than traditional methods: 1) group reward and 2) individual accountability (Slavin).

Applications of "Cooperative Learning" to Vocational Education

Vocational education programs provide excellent settings for cooperative learning and team competition. The latter competitions

can occur especially through vocational clubs that may involve group projects. Research on cooperative learning in effective schools suggests that vocational teachers should: 1) discuss with students the concept of team learning; 2) form teams that reflect a range of performance, sex, and ethnic mix of the class, 3) select rewards that are attractive to the student peer culture, and 4) observe both individual and group accountability.

Vocational teachers typically use a variety of group activities including:

- Livestock judging teams at county and state fairs
- Model or simulated office operations
- Auto diagnosis and repair contests
- School landscaping project
- Construction of an actual home
- Planning and implementing a fashion show

Additionally, school-endorsed programs such as Junior Achievement, Explorer Scouting, and 4-H accomplish their activities through cooperative learning activities. The National Commission on Resources for Youth has been a strong advocate for cooperative learning and has developed useful guidelines for what they call a collaborative group (1983). They particularly emphasize the need for structure, flexibility, and responsible roles for youth.

Critical Factor: Effective Learning Climate

Researchers have found schools that have effective learning climates also have high levels of achievement; conversely, schools

with ineffective learning climates produce low levels of student achievement. General findings include:

- Effective school learning climate is comprised of "appropriate conditions for learning." It refers to attitudinal and behavioral patterns in a school which affect levels of achievement (Brookover 1982).

- School learning climate is also defined as "the norms, beliefs and attitudes reflected in institutional patterns and behavior practices that enhance or impede student learning" (Lezotte et al. 1980).

- Three clusters of school characteristics make a difference in the level of achievement and have an interactive relationship: ideology, organizational structure and instructional practices. There is a basic and important distinction between school climate and school learning climate (Brookover 1982):

  1. School learning climate relates to student achievement and those factors within a school that affect achievement.

  2. A school's learning climate is the collective set of attitudes, beliefs and behaviors within a building. It goes beyond the individual to the group norms of a school. These norms tend to be maintained over time with new members being socialized into the prevailing set of behaviors.

  3. The school learning climate describes the school as a social system. Since schools share a common function in society, there is some similarity in learning climates. On the other hand, different schools stress different "philosophies," instructional practices and methodologies, and beliefs and expectations of students' abilities to learn. Consequently, school learning climate varies sufficiently to produce different levels of student achievement.

  4. The school learning climate can be changed. Local and building norms do change and the people who are members of the school social group are the change agents. Outsiders are unlikely to have much impact on the social group unless that group desires or is willing to change.

- School learning climate can explain as much of the achievement differences among schools as do SES and race (Lezotte et al. 1980).

- School learning climate as an effect on student achievement is documented in other countries: Israel junior high schools (Chen and Fresko 1978); high schools in Ireland (Madaus et al. 1979); London, England high schools (Rutter et al. 1979). The results of the foreign studies support the work done in high schools in this country (Brookover et al. 1979; McDill, Meyers, and Rigsby 1967; Glasheen, Hadley, and Schneider 1977).

Applications of "Effective Learning Climate" to Vocational Education

In applying research on "effective learning climate" to vocational education it is useful to first distinguish among three learning environments--the total high school, the vocational program as a subculture within the school, and the workplace. Students often have quite different feelings regarding these three environments and the learning culture of each setting. Some vocational students we have interviewed feel a more personalized attachment to the vocational program or work site setting than they do to the rest of the school. They see their role and the expectations of adults toward them as entirely different from one environment to another.

In a study of the workplace as a learning environment, 1100 senior high school students who were enrolled in Experience-Based Career Education Programs in 16 states were surveyed (Owens and Owen 1981). The research centered on the job site characteristics youth associate with excellent or with poor community learning experiences. Factors found to lead to excellent learning at job sites included the opportunity for hands-on learning and for applying the learning to new things, positive interactions with adults, being given adult

responsibilities, having clear directions to follow, and being given challenging tasks.

A study focusing on developing responsibility in youth centered on the role played by the home, the school, and the workplace (Owens 1983). In the perception of the young people interviewed, high school helped them become more responsible by being expected to be on time and to do homework. However, many students felt they were not treated as adults in most classes. Their vocational and career education programs were often perceived as a more trusting and supportive environment. Being at a work site was seen by students as an opportunity to work independently, be trusted as an adult, and to feel "worth something."

Vocational educators need to consider the ways in which they can improve the learning climate in each of the three settings. At the total school level, vocational teachers can cooperate with the principal and other staff by establishing and following consistent procedures regarding student attendance, grading, and other common functions. Within the vocational education department, they might agree to enforce some additional common standards in areas such as shop safety. For students involved in cooperative education or other work-related programs, the vocational staff can help to establish an effective learning climate by working closely with employers in agreeing on student placement objectives, monitoring student performance at these sites, and providing positive reinforcement to students for excellent work performed at these sites.

Critical Factor: Use of Evaluation

An integral part of developing and maintaining an effective school learning climate is regular and consistent use of evaluation techniques. The efficient use of assessment data is an important tool in making decisions regarding program improvement. General findings include:

- Teachers and other staff can increase the level of student achievement in their classrooms when they use assessment data to guide needed curricular and instructional modifications (Brookover et. al 1982).

- Objective-referenced teacher-made tests allow for more frequent modification of instruction by furnishing measurements of classroom achievement of specific objectives over shorter periods of time (Block and Anderson 1975).

- Oral testing should be used with students who have reading problems or react negatively to written tests (Brookover et. al 1982).

- Frequent progress tests serve two purposes: 1) they familiarize students with testing through practice and 2) they provide assessment information more frequently (Brookover et. al 1982).

- Norm-referenced tests are a poor measure for many instructional programs; tests must focus on the same content as is actually taught in the classroom (IRT study 1979).

- In effective schools:

  1) Staff know how students are doing and let students know.

  2) Student assessment is planned, regular, and routine and causes minimal disruption of classroom instruction.

  3) Testing results are reported quickly in terms of learning objectives on which students were tested.

  4) at the district level, clearly stated assessment procedures are carried out by district staff; major tests are announced well in advance to allow time for building and classroom scheduling; there are specific routines for scoring, storing, reporting, and analyzing results.

5) at the building level, staff follow simple routine procedures for frequent collection, summarization, and reporting of student achievement information; individual student records are maintained regarding achievement, discipline, and tardiness; and

6) at the classroom level, teachers frequently monitor student learning, both formally and informally; teachers know and use test development techniques to design valid, reliable assessment instruments; assessment is routinely handled and students quickly hear results; reports of results to students are simple, clear and tied to learning objectives (GBE Program Document 1982).

Applying "Use of Evaluation" to Vocational Education

Evaluation is used in vocational education to: 1) assess teachers' occupational competency, 2) assess student readiness for particular learning, 3) evaluate student progress and mastery of learning objectives, and 4) evaluate program effectiveness. As in the effective schooling literature, it is important to plan not only how the data will be collected but also how they will be reported and used for student and program improvement.

Unlike academic teachers who rely heavily on standardized and teacher-made tests, vocational educators have a greater opportunity to use competency based performance measures, computer simulations, direct observation, and product evaluation based on standards found in business and industry. Performance tests can be used to provide students with explicit feedback on which skills they have mastered and which ones require further practice. Direct observation of student behaviors is especially effective for judging students' understanding of safety precautions and correct assembly or performance procedures. Because vocational classes often result in students producing tangible

products, teachers and students can evaluate the physical products using commonly accepted industrial standards. Thus, there is often less subjectivity in these evaluations than might be true in grading student essays.

An evaluation issue being faced by some school districts is the attempt to agree upon and use common performance tests across all classes with the same title. This approach has the advantage of assuring employers that students who have passed a particular automotive course, for example, will also be able to demonstrate a minimum set of skills regardless of the school attended.

A standard approach to this problem is a modified job or task analysis procedure whereby local employees validate a set of employability skills or occupational tasks. Some districts then utilize a skill development record or card as a way to document competence.

This section of the paper has attempted to describe selected principles of effective schooling research and show how they are or could be applied to secondary vocational education. The following section will use a similar approach based on principles learned from successful businesses.

V. APPLYING FINDINGS FROM STUDIES OF SUCCESSFUL BUSINESSES

The Peters-Waterman Study

Supporting future directions for research to improve vocational education are principles of excellence identified by Thomas J. Peters and Robert H. Waterman, Jr. We believe principles of excellence resulting from Peters and Waterman's study of 62 of America's best-run companies provide some useful insights into achieving excellence in school career and vocational programs as well. First, however, cautions are in order. The bottom line profit motive of the private sector is not applicable to public education. Nor are schools free to determine what to produce or who their clients will be. Some of the eight principles that Peters and Waterman derived from studying large corporations may not apply to all vocational settings. Just as they may not apply to smaller school districts or smaller businesses. Likewise, certain principles may be more relevant to vocational education than others. Indeed, Peters himself in a recent interview with U.S. News and World Report, expressed the belief that a bias for action, closeness to the customer, and high productivity through people (see definitions that follow) are the three most important qualities for corporate success.

The principles developed by Peters and Waterman warrant serious consideration and suggest some exciting implications for secondary vocational education, particularly when we know that graduates will soon be entering the workplace where these principles may be applied.

Description and Application of Principles

In Search of Excellence delineates eight principles: 1) A Bias for Action; 2) Close to the Customer; 3) Autonomy and Entrepreneurship; 4) Productivity Through People; 5) Hands-On, Value-Driven; 6) Stick to the Knitting; 7) Simple Form, Lean Staff; and 8) Simultaneous Loose-Tight Properties. A description of each principle is given followed by applications to the vocational education setting.

A Bias for Action. The more successful companies decide on new directions very quickly without waiting for extensive analysis of issues before moving. One business establishment uses the motto, "ready, fire, aim"--a maxim implying their willingness to take action and then refine actions as they proceed.

Close to the Customer. Listening to customers' advice and responding to changing customer requests is needed for success in business. The importance of the customer is kept in mind, not just costs and profits.

Autonomy and Entrepreneurship. Personal leadership and self-initiative are recognized and rewarded in successful companies. Certain people are valued who take responsibility for moving products from the invention to the marketing stage.

Productivity Through People. Peters and Waterman suggest increased productivity can occur by rewarding successful employees and treating them as adults. Quality circles are one example of how employee ideas are taken seriously and used.

Hands-On, Value-Driven. Successful executives select a few key values and stress those values in all aspects of business. For example, "teamwork" is not only an advertising slogan for Delta Airlines, but is emphasized in the company's policies and day-to-day operations.

Stick to the Knitting. Successful companies, according to Peters and Waterman, concentrate on those things they are experienced with and do well. They are reluctant to enter unrelated fields in which they have no experience or knowledge.

Simple Form, Lean Staff. Large corporations in the 1980's are finding ways to keep the number of central office staff to a minimum. Newer management styles of some high technology firms are calling for less hierarchy, greater staff accessibility to executives, and less need for middle management personnel.

Simultaneous Loose-Tight Properties. Encouraging decision making at the local level while retaining central monitoring of a few key factors is the final success principle discussed by Peters and Waterman. An example of this principle in business is IBM top management knowing within hours when the company has lost a corporate customer. While such information is gathered companywide, other IBM functions are highly decentralized.

The following table displays each principle of excellence, giving an example of what is currently being done in some vocational education programs or what could be done. This in no way is intended as a comprehensive application of these principles, but merely as an illustration of possibilities. School and district staff could use these principles to generate a more complete model.

TABLE 5

APPLICATION OF EXCELLENT BUSINESS PRACTICES TO VOCATIONAL EDUCATION

	What is being done	What could be done
A Bias for Action	Many vocational educators are skilled in moving quickly from subject matter theory to involving students in hands-on applications. Diversified occupations classes and cooperative education provide immediate opportunities for learning in new and emerging vocations.	As local labor market conditions change, high school vocational educators need to become adept in dropping programs showing no demand for employment and in adding training for high demand occupations. Short term training--often felt to be a postsecondary responsibility--may need to be considered in high school as well. A short course in running electronic cash registers or waiting tables may give students higher preference in a competitive job market.
Close to the Customer	Input from local advisory committees for some occupational clusters is helping vocational instructors keep their courses up-to-date. Student and employer follow-up studies in some districts are used to gather "customer" feedback that is used for program improvement.	With the increasing need for economic development collaboration, schools and community colleges need to work together in anticipating local employers' specific needs. Encouraging employees to teach segments of vocational courses in which they have special expertise would also help ensure that students are receiving up-to-date instruction in areas of importance to local employers.

Autonomy and Entrepreneurship	Some vocational programs give students excellent experiences in forming and operating "companies" to produce and market products and services. Junior Achievement is one example of an out-of-school program with similar objectives.	Employers are calling on schools to do a better job in helping students understand the free enterprise system. Some corporate executives might be excellent classroom speakers to address this topic and arouse student interest.
Productivity through People	Students in cooperative education programs are often treated like regular employees while in the workplace and their suggestions are sometimes used to improve operations.	In the vocational classroom and shops, students should be treated as responsible adults and rewarded for excellence in individual and group performance.
Hands-On, Value Driven	Students in effective vocational programs leave with mastery of transferable occupational skills and good work habits that have been reinforced in vocational courses as well as through the social climate of the entire school.	At the school and district level, confusion often exists as to primary purposes of vocational education. Clarification and agreement should be reached as to whether particular courses are designed primarily to orient students to the world of work and/or to teach essential occupational skills needed for job entry.
Stick to the Knitting	Some schools are successfully emphasizing applied basic skills, good work habits, and essential occupational skills in vocational areas.	High schools may need to reassess whether, in attempting to offer a wide variety of occupational areas and specialty courses, they may be reducing the quality of some basic vocational offerings.
Simple Form, Lean Staff	Budget cuts have forced reductions in the number of vocational specialists at the state and district level. This can sometimes force the central staff to take a more integrated approach to vocational education.	Improved collaboration with community colleges and private industry may allow some students to receive credit for specialized training taken outside of high school and may also result in eliminating duplication of services.

Simultaneous Loose-Tight Properties	The entire staff in some schools has agreed on common guidelines for handling student discipline problems while allowing individual teachers freedom to work within those guidelines.	Districts could establish districtwide minimum competencies required for students to complete a particular occupational class. Additionally, they could give maximum freedom to teachers helping students master these competencies and in deciding optional competencies to add.

VI. CONCLUSIONS AND RECOMMENDATIONS

Improving Vocational Education Policy

Policy implications as presented in this study center on state and local leaders defining the key purposes for secondary vocational education and the relationship of those programs to the overall goals of the high school.

Currently, a need exists to examine vocational education within the broader goals of a total secondary program. While individual instructors have assessed specific vocational education outcomes, very few attempts have been made to take a comprehensive look across vocational education programs. When such attempts have been undertaken in the past, they generally did not relate variations in vocational education content and delivery approaches to variations in learning outcomes. Therefore, little information is available as to which processes can be associated with excellence in vocational education outcomes.

Schools that wish to be effective in producing overall high student achievement must closely examine their goals and objectives. A primary goal of education in many school districts is helping young people master basic communication, computation, and cognitive skills. Educational objectives including those for vocational education, need to be examined to determine how they contribute to mastery of these new basic skills described by some to include reading, speaking/listening, writing, math, computer

literacy, applied science, and problem solving skills. Therefore, an initial task of vocational education policy makers is to relate vocational education to the instructional goals and objectives held for all students. Mastery of the basic skills is critical; vocational education programs must serve to enhance this purpose.

At the same time policy makers are examining how vocational education contributes to overall improvement in basic skills, it is also appropriate to examine how the objectives of the academic and general curriculum are contributing to the preparation of future workers and citizens. Policies that result in improved student attendance and punctuality, concern for producing quality work, and respect for others can all contribute to future employability.

Improving Vocational Education Practice

Those looking to improve vocational education programs will need to first assess current program effectiveness. Responsibility for this assessment should be shared by the state, the school board, the principal, vocational administrators, instructors, employers, and students. The state board and educational leaders can propose new standards and criteria for excellent vocational programs that reflect the principles of effective schooling and successful business practices described in this paper. The school board and superintendent can set up requirements for periodic evaluation and contribute ideas regarding standards for vocational excellence as part of a comprehensive educational program. The building principal or vocational administrator should assume responsibility for collecting

and reporting data, communicating those data, and making sure that the data are used to improve the vocational education program. Additionally, the principal should be the initiator of school modifications to resolve problems made apparent by the findings. Vocational administrators and instructors have a role in collecting assessment data and working with employers through local advisory committees to interpret the findings and discuss implications for program change. Students in vocational programs have a role to play in improving their programs both while they are enrolled in school and after they graduate. While in school they can point out to their instructors the concepts and skills they are having trouble mastering and can assess the quality of instruction. As program completers they can provide feedback on the various aspects of their vocational training that were or were not useful for employment or future training.

As an early step in improving vocational education it would be useful to apply some of the principles previously discussed in this paper that were taken from effective schooling research and from a study of successful businesses. One approach would be to develop a self-report program evaluation checklist or rating scale that applies principles from effective schooling and successful business practices. For example, in applying "a bias for action," a rating item might assess the extent to which vocational teachers are encouraged to experiment in their courses and to modify practices that need improvement. Applied to administrators, an item might assess the flexibility administrators show in adding or deleting vocational

courses to reflect changes in the local labor market. Such a checklist or rating scale could be used to help determine how vocational education instructors and advisory committees judge their programs. A discrepancy analysis could then be employed to determine variations in perceptions of staff and advisory committees. Subsequently, the principal, vocational administrator and staff might select one or two priorities to focus on for vocational education program improvement over the next year.

Improving Vocational Education Research

By 1990 it would be exciting to be able to point to various research syntheses that had identified key factors found across a variety of studies to have demonstrated impact on vocational outcomes. Currently, this data base exists only in regard to effective elementary schools. To reach this 1990 goal, a number of steps need to be taken. It is important that vocational education studies begin to relate outcomes to specific program characteristics. The six principles derived from effective schools research and the eight principles from successful businesses are recommended as starting points for identifying causal factors. Another step in reaching the 1990 goal is for researchers to identify the most and least successful high school vocational programs on various outcomes. Additionally, researchers need to observe these "outlier" programs to determine what makes the difference in outcome attainment aside from the background characteristics of students. It is also important to discover if factors determining success in vocational education are

the same or different from factors determining school success in nonvocational areas. Finally, the cooperative sharing of results and replication of studies by other researchers will be essential in establishing generalizations of the findings.

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